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METEOROLOGICAL DATA REPORT

AEROBEE NASA 4.92
(20 May 1966)

BY

GORDON L. DUNAWAY

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ATMOSPHERIC SCIENCES LABORATORY
WHITE SANDS MISSILE RANGE, NEW MEXICO

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METEOROLOGICAL DATA REPORT

AEROBEE NASA 4.92
(20 May 1966)

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Gordon L. Dunaway

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DA Task IV650212A127-02

ATMOSPHERIC SCIENCES LABORATORY
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ABSTRACT

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Meteorological data gathered for the launching of Aerobee NASA 4.92 are presented for the National Aeronautics and Space Administration and for ballistic studies. The data appear, along with calculated ballistic data, in tabular form.

Author

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INTRODUCTION

Aerobee NASA 4.92 was launched by Naval Ordnance Missile Test Facility personnel, White Sands Missile Range (WSMR), New Mexico, at 1630 hours MST, 20 May 1966.

Meteorological data used in conjunction with theoretical calculations to predict rocket impact were collected by the Meteorological Support Division, Atmospheric Sciences Laboratory, White Sands Missile Range, New Mexico. The Ballistic Meteorologists for this firing were Gordon L. Dunaway and Stanley F. Kubinski.

DISCUSSION

Wind data for the first 4,000 feet above the surface were obtained from a Double-Theodolite Wind Velocity Computer System (1). Balloons released at the launch site were observed and tracked from a 2,000-foot baseline. Continuous angular data were transmitted from two electrically instrumented theodolites to a computer where the data were reduced to obtain a velocity-vs-height relationship. The computer output drives two recorders which trace north-south and east-west components on a specially designed wind velocity computer ballistic chart. It is possible to read directly from the chart both the mean wind component values and the mean ballistic wind components in the various ballistic layers.

Temperature, pressure and humidity data, along with upper wind data from 4,000 to approximately 100,000 feet above the surface, were obtained from standard rawinsonde operations.

Mean wind component values in each ballistic zone were determined from vertical cross sections by equal-area method.

Data appearing in Tables IX, X and XI are based on the L. D. Duncan (2) theory. The "Predicted Impact" includes, when applicable, an adjustment of impact based on the experience of the Ballistic Meteorologists and the forecast of firing time wind conditions.

REFERENCES

1. "Double-Theodolite Wind Velocity Computer," UNCLASSIFIED, U. S. Army Signal Research and Development Laboratory, Fort Monmouth, New Jersey, July 1959.
2. Duncan, L. D. and R. J. Ensey, November 1964: "Six Degree of Freedom Digital Simulation Model for Unguided Fin-Stabilized Rockets." ERDA-196, Environmental Sciences Directorate, United States Army Electronics Research and Development Activity, White Sands Missile Range, New Mexico.

PAYLOAD	Includes Nosecone Weight;	269.0	Pounds
*UNIT WIND EFFECT	Cross	3.54	Miles/MPH
	Range	4.17	Miles/MPH
TOWER TILT EFFECT		18.85	Miles/Degree
BURNOUT	Velocity	5,665	Feet/Second
	Altitude	126,200	Feet MSL
	Time	51.8	Seconds
PEAK	Altitude	120.5	Miles MSL
	Time	232.0	Seconds
TOTAL FLIGHT TIME		436.0	Seconds
CORIOLIS EFFECT	West	5.7	Miles

TABLE I. THEORETICAL ROCKET PERFORMANCE VALUES
AEROBEE NASA 4.92

* An empirical correction (85 percent of the total) has been made to the cross-unit wind effect. This correction was determined from statistical studies.

LAYERS IN FEET ABOVE GROUND	BALLISTIC FACTOR
143- 250	.185
250- 400	.115
400- 600	.100
600- 800	.062
800-1200	.053
1200-1600	.031
1600-2000	.025
2000-2500	.029
2500-3000	.023

LAYERS IN FEET ABOVE GROUND	BALLISTIC FACTOR
3000- 3500	.019
3500- 4000	.016
4000- 5000	.031
5000-10000	.096
10000-15000	.056
15000-20000	.033
20000-25000	.023
25000-30000	.017
30000-35000	.014

LAYERS IN FEET ABOVE GROUND	BALLISTIC FACTOR
35000- 40000	.009
40000- 45000	.006
45000- 50000	.012
50000- 60000	.010
60000- 70000	.009
70000- 80000	.007
80000- 90000	.008
90000-100000	.010

TABLE II. BALLISTIC FACTORS
AEROBEE NASA 4.92

TIME IN MINUTES	ANEMOMETER-MEASURED WIND	
	Speed (Knots)	Direction (Degrees)
T - 15	6.0	190
T - 10	4.0	260
T - 5	2.0	265
T - Time	3.5	300
T + 5	4.0	250
T + 10	4.5	200
T + 15	5.0	180

TABLE III. ANEMOMETER-MEASURED WIND SPEED AND DIRECTION
AEROBEE NASA 4.92

NOTE: Wind speeds and directions are 5-minute averages
centered at indicated times.

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS IN MILES PER HOUR											
	1 1330 MST		2 1400 MST		3 1430 MST		4 1450 MST		5 1510 MST		6 1530 MST	
	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W
143- 250	0.0	5.5W	1.0N	0.0	1.5N	5.5W	15.0S	5.0W	0.5S	0.5E	10.0S	2.5W
250- 400	1.0S	7.0	2.5S	0.0	0.5S	8.5	7.0	1.0	0.5	0.5	14.5	2.0
400- 600	3.0	4.0	7.5	1.5E	1.5N	8.5	4.0	0.0	1.5	3.5	17.5	4.0
600- 800	2.5	1.5	9.0	1.0	1.0S	9.5	3.0	2.0E	3.0	5.0	17.0	4.5
800-1200	4.5	1.5	10.0	0.5W	1.0	6.5	6.0	2.0	2.5	3.0	15.0	7.5
1200-1600	5.0	2.0	10.0	1.0	0.5N	5.0	6.0	5.0W	3.5	3.0	11.0	10.0
1600-2000	4.5	2.5	6.0	5.0	2.5S	9.5	5.5	10.0	5.5	1.0	11.5	7.0
2000-2500	5.5	4.0	3.0	5.5	0.0	10.5	6.0	8.0	3.5	1.5	16.0	5.0
2500-3000	3.5	4.0	6.5	6.0	0.0	6.0	8.0	8.0	9.0	6.5W	20.5	10.0
3000-3500	1.5	4.5	3.5	5.5	0.0	3.5	8.0	7.0	14.5	3.0	12.0	9.5
3500-4000	0.0	0.5	8.0	7.5	0.0	3.0	8.0	6.0	20.0	3.0	11.0	6.5

TABLE IV. PILOT-BALLOON-MEASURED WIND DATA
(DOUBLE-THEODOLITE METHOD)
AEROBEE NASA 4.92

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS IN MILES PER HOUR											
	7		8		9		10		11		12	
	1545 MST		1558 MST		1615 MST		1620 MST		1625 MST		1631 MST	
	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W
143- 250	14.0S	10.5W	4.5S	1.5W	3.0N	3.5W	2.0S	3.0W	2.0S	1.0E	2.0N	1.0W
250- 400	15.5	11.0	6.0	0.5	3.5	3.0	3.5	4.5	1.5	0.0	2.5	2.0
400- 600	13.5	13.0	7.0	2.0	4.0	3.5	1.5N	3.0	3.0	2.5W	2.0S	4.0
600- 800	11.0	14.5	10.5	4.0	2.5S	6.0	2.5	1.5	2.5	5.0	3.5	3.0
800-1200	10.5	15.0	0.5N	7.5	3.5	7.0	3.0	3.0	0.0	2.0	3.5	1.0
1200-1600	9.0	15.0	2.0	6.5	0.5	4.0	9.5	0.0	9.0S	0.0	2.0	2.5
1600-2000	10.0	14.0	0.0	3.5	1.5	2.0	8.5	1.0E	11.0	1.0E	11.5	3.0
2000-2500	8.5	14.5	1.0S	8.0	3.0	0.5	9.0	2.5W	12.5	6.5	5.0	2.5
2500-3000	10.0	11.0	1.5N	8.5	6.0	4.0	12.0	0.0	9.0	4.0	8.5	3.0
3000-3500	15.5	17.0	8.5	9.0	4.0	2.5	15.0	3.5E	6.5	0.0	12.0	3.0
3500-4000	11.5	15.5	6.0	10.0	8.0	5.0	14.5	5.0	11.0	2.0W	11.0	1.5

TABLE IV. PILOT-BALLOON-MEASURED WIND DATA (Cont)
(DOUBLE-THEODOLITE METHOD)
AEROBEE NASA 4.92

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS IN KNOTS	
	1	
	1600 MST	
	N-S	E-W
4000- 5000	4.0N	1.5W
5000-10000	3.5S	9.5
10000-15000	0.0	16.0
15000-20000	0.0	14.0

TABLE V. UPPER AIR DATA (4,000-20,000 FT)
AEROBEE NASA 4.92

∞

LAYERS IN FEET ABOVE GROUND	MEAN WIND COMPONENTS IN KNOTS					
	1		2*		3	
	1100 MST		1330 MST		1630 MST	
	N-S	E-W	N-S	E-W	N-S	E-W
4000- 5000	0.0	9.0W	2.0S	3.5W	2.5S	13.0W
5000- 10000	4.0S	7.0	1.0	7.0	0.0	10.0
10000- 15000	0.0	5.0	2.5N	4.5	4.5N	11.0
15000- 20000	2.0N	11.0	2.5	13.0	0.0	19.0
20000- 25000	3.0S	16.5	0.0	17.0	3.0N	16.0
25000- 30000	0.0	27.0	0.0	28.0	6.0S	33.5
30000- 35000	6.5S	37.5	8.0S	44.5	12.0	67.0
35000- 40000	16.5	46.0	19.0	51.5	9.0	50.0
40000- 45000	16.5	46.0	25.0	43.5	9.5	54.0
45000- 50000	24.0	41.5	13.5	37.5	14.5	40.5
50000- 60000	10.5	18.0	10.5	18.0	9.0	15.5
60000- 70000	9.5	3.5	4.5N	4.0	8.5N	5.0
70000- 80000	1.0	5.0E	4.0S	10.5E	0.0	13.0E
80000- 90000	5.0	13.0	5.0	8.5	BALLOON BURST	
90000-100000	8.5	7.0	0.0	5.0		

TABLE VI. UPPER AIR DATA (4,000-100,000 FT)
AEROBEE NASA 4.92

* Rawin, telecompute data not available.

STATION ALTITUDE 3989.0 FEET MSL
 20 MAY 66 1100 HRS MST
 ASCENSION NO. 361

UPPER AIR DATA
 3914012
 WHITE SANDS SITE
 TABLE VII

WSTM SITE COORDINATES
 E 488,580 FEET
 N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	TEMPERATURE DEWPOINT CENTIGRADE	RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA		INDEX OF REFRACTION
							DIRECTION DEGREES(TN)	SPEED KNOTS	
3989.0	878.0	27.8	9.2	31.0	1011.4	677.2	220.0	6.0	1.000274
4000.0	877.7	27.7	9.1	30.8	1011.3	677.1	220.1	6.0	1.000273
4500.0	862.6	25.0	2.2	22.6	1005.0	673.3	225.1	5.8	1.000254
5000.0	847.6	23.1	-0.0	21.6	994.2	671.1	230.1	5.6	1.000248
5500.0	832.7	21.6	0.2	24.0	981.6	669.5	235.1	5.5	1.000246
6000.0	818.2	20.1	0.2	26.3	969.1	667.8	240.2	5.3	1.000243
6500.0	803.8	18.7	0.2	28.7	956.9	666.1	245.2	5.1	1.000241
7000.0	789.8	17.2	-0.0	31.0	944.9	664.5	250.2	4.9	1.000238
7500.0	775.7	16.0	-1.1	30.9	932.2	663.0	256.5	6.5	1.000233
8000.0	761.8	14.9	-2.9	29.1	919.1	661.7	263.1	8.5	1.000227
8500.0	748.2	13.9	-4.6	27.4	906.1	660.4	265.5	9.4	1.000222
9000.0	734.8	12.9	-6.4	25.6	893.4	659.2	265.4	9.7	1.000217
9500.0	721.6	11.8	-8.3	23.8	880.8	657.9	263.9	9.4	1.000212
10000.0	708.7	10.8	-10.1	22.0	868.4	656.6	261.5	8.5	1.000207
10500.0	695.5	9.5	-10.4	23.5	856.1	655.1	254.2	7.5	1.000204
11000.0	682.6	8.2	-10.7	25.0	844.0	653.6	244.0	6.5	1.000201
11500.0	669.9	6.9	-11.1	26.4	832.2	652.1	232.9	6.3	1.000198
12000.0	657.4	5.6	-11.6	27.9	820.5	650.6	221.4	6.3	1.000195
12500.0	645.2	4.3	-12.0	29.3	809.0	649.1	211.5	6.3	1.000192
13000.0	633.2	3.0	-12.6	30.8	797.7	647.5	203.0	6.2	1.000189
13500.0	621.4	1.7	-13.1	32.3	786.6	646.0	200.0	6.1	1.000186
14000.0	609.9	0.4	-13.7	33.7	775.6	644.5	200.2	5.6	1.000184
14500.0	598.5	-0.8	-14.4	35.2	764.8	642.9	205.1	4.6	1.000181
15000.0	587.4	-2.1	-15.0	36.7	754.2	641.4	216.5	3.7	1.000178
15500.0	576.5	-3.4	-15.7	38.1	743.8	639.9	232.4	2.9	1.000175
16000.0	565.6	-4.8	-16.5	39.6	733.4	638.2	268.1	2.7	1.000172
16500.0	554.6	-6.2	-17.4	40.9	723.0	636.5	309.4	2.7	1.000169
17000.0	543.8	-7.6	-18.3	42.3	712.9	634.8	328.4	3.2	1.000167
17500.0	533.2	-9.1	-19.3	43.7	702.9	633.0	344.6	3.8	1.000164
18000.0	522.8	-10.5	-20.2	45.1	693.0	631.3	351.0	4.7	1.000161

STATION ALTITUDE 3989.0 FEET MSL
 20 MAY 66 1100 HRS MST
 ASCENSION NO. 361

UPPER AIR DATA
 3914012
 WHITE SANDS SITE
 TABLE VII (Cont)

WSTM SITE COORDINATES
 E 488,580 FEET
 N 185,045 FEET

GEOMFTRIC ALTITUDE MSL FFEET	PRESSURE MILLIBARS	TEMPERATURE		RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			KNOTS	KNOTS	DIRECTION DEGREES(TN)	SPEED KNOTS	
18500.0	512.7	-12.0	-21.2	46.5	683.3	629.6		350.5	5.1	1.000159
19000.0	502.7	-13.4	-22.2	47.9	673.8	627.8		336.4	4.6	1.000156
19500.0	492.7	-14.7	-22.4	52.6	663.9	626.2		315.2	4.8	1.000154
20000.0	482.9	-15.6	-22.3	56.9	652.9	625.1		284.0	6.0	1.000151
20500.0	473.3	-16.1	-22.1	60.5	640.9	624.6		266.9	7.9	1.000149
21000.0	463.8	-16.5	-21.8	64.0	629.2	624.0		262.8	10.6	1.000146
21500.0	454.5	-17.8	-23.1	63.6	619.5	622.5		263.7	12.3	1.000144
22000.0	445.3	-19.0	-24.3	63.3	610.1	621.0		267.1	13.7	1.000141
22500.0	436.4	-20.2	-25.8	61.2	600.6	619.5		271.3	14.4	1.000138
23000.0	427.5	-21.2	-28.7	51.2	590.8	618.2		275.6	15.0	1.000135
23500.0	418.7	-22.2	-31.9	41.2	581.1	617.0		276.1	15.2	1.000132
24000.0	410.1	-23.4	-35.1	33.4	571.9	615.5		275.7	15.4	1.000129
24500.0	401.7	-24.6	-38.5	26.6	563.0	613.9		271.7	15.8	1.000127
25000.0	393.4	-25.9	-41.4	22.1	554.2	612.3		268.8	16.1	1.000124
25500.0	385.1	-27.1	-42.2	22.6	545.1	610.9		267.8	16.2	1.000122
26000.0	376.9	-28.3	-43.1	23.0	536.2	609.4		265.6	16.5	1.000120
26500.0	369.0	-29.5	-44.0	23.4	527.5	607.9		262.8	16.8	1.000118
27000.0	361.2	-30.7	-44.8	23.8	518.9	606.4		262.0	16.7	1.000116
27500.0	353.6	-31.9	-45.7	24.3	510.5	604.9		261.5	16.8	1.000114
28000.0	346.1	-33.1	-46.6	24.7	502.3	603.4		261.6	17.8	1.000112
28500.0	338.8	-34.2	-47.4	25.2	493.9	601.9		261.6	19.1	1.000111
29000.0	331.5	-35.1	-48.1	25.7	485.2	600.7		261.4	21.2	1.000109
29500.0	324.3	-36.1	-48.8	26.2	476.6	599.5		261.9	23.7	1.000107
30000.0	317.3	-37.0	-49.4	26.7	468.2	598.3		263.2	26.7	1.000105
30500.0	310.3	-38.1	-50.6	26.0**	459.9	597.0		265.1	29.2	1.000103
31000.0	303.3	-39.2	-52.3	24.1**	451.7	595.5		267.4	31.3	1.000101
31500.0	296.5	-40.4	-54.0	22.2**	443.7	594.1		270.7	31.8	1.000099
32000.0	289.8	-41.5	-55.7	20.2**	435.9	592.6		274.3	31.8	1.000097
32500.0	283.3	-42.7	-57.5	18.3**	428.2	591.2		275.9	30.8	1.000096
33000.0	276.9	-43.8	-59.3	16.4**	420.6	589.7		276.9	29.7	1.000094

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

UPPER AIR DATA
3914012
WHITE SANDS SITE
TABLE VII (Cont)

WSTM SITE COORDINATES
E 488,580 FEET
N 185,045 FEET

STATION ALTITUDE 3989.0 FEET MSL
20 MAY 66 1100 HRS MST
ASCENSION NO. 361

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA DIRECTION DEGREES(TN)	SPEED KNOTS	INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			KNOTS	KNOTS			
33500.0	270.6	-44.9	-61.2	14.5**	413.2	588.2		274.6	28.2	1.000092
34000.0	264.6	-46.1	-63.3	12.5**	405.9	586.8		271.2	27.5	1.000090
34500.0	258.6	-47.2	-65.4	10.6**	398.8	585.3		265.4	28.7	1.000089
35000.0	252.8	-48.3	-67.8	8.7**	391.7	583.8		260.8	31.0	1.000087
35500.0	247.1	-49.5	-70.4	6.8**	384.9	582.3		257.6	34.7	1.000086
36000.0	241.5	-50.6	-73.6	4.9**	378.1	580.9		256.0	38.4	1.000084
36500.0	236.1	-51.8	-77.7	2.9**	371.5	579.4		255.8	41.9	1.000083
37000.0	230.8	-52.9	-84.8	1.0**	365.0	577.9		255.8	45.0	1.000081
37500.0	225.4	-53.7	0.	-0. **	357.9	576.8		256.1	47.8	1.000080
38000.0	220.1	-54.2	0.	-0. **	350.2	576.2		255.9	49.7	1.000078
38500.0	214.9	-54.6	0.	-0. **	342.6	575.6		255.6	50.9	1.000076
39000.0	209.8	-55.0	0.	-0. **	335.2	575.0		255.1	51.7	1.000075
39500.0	204.9	-55.5	0.	-0. **	328.0	574.5		254.7	52.4	1.000073
40000.0	200.0	-55.9	0.	-0. **	320.9	573.9		255.1	51.9	1.000071
40500.0	195.3	-56.4	0.	-0. **	313.9	573.3		256.0	50.7	1.000070
41000.0	190.7	-56.8	0.	-0. **	307.2	572.7		256.8	50.0	1.000068
41500.0	186.2	-57.3	0.	-0. **	300.5	572.1		257.5	49.6	1.000067
42000.0	181.8	-57.7	0.	-0. **	294.0	571.5		256.8	50.3	1.000065
42500.0	177.5	-58.2	0.	-0. **	287.7	570.9		255.7	51.2	1.000064
43000.0	173.3	-58.6	0.	-0. **	281.5	570.3		254.2	52.0	1.000063
43500.0	169.2	-59.1	0.	-0. **	275.4	569.7		252.5	52.8	1.000061
44000.0	165.2	-58.8	0.	-0. **	268.5	570.1		251.0	53.1	1.000060
44500.0	161.3	-58.1	0.	-0. **	261.3	571.0		249.6	53.1	1.000058
45000.0	157.4	-57.5	0.	-0. **	254.3	571.8		249.1	52.6	1.000057
45500.0	153.7	-57.2	0.	-0. **	248.0	572.2		249.7	51.3	1.000055
46000.0	150.0	-57.6	0.	-0. **	242.4	571.7		249.5	49.5	1.000054
46500.0	146.4	-58.0	0.	-0. **	237.0	571.2		248.1	46.8	1.000053
47000.0	142.8	-58.4	0.	-0. **	231.7	570.7		246.0	44.7	1.000052
47500.0	139.4	-58.7	0.	-0. **	226.5	570.2		243.0	43.7	1.000050
48000.0	136.1	-59.1	0.	-0. **	221.5	569.7		240.3	43.8	1.000049

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** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

UPPER AIR DATA
3914012
WHITE SANDS SITE
TABLE VII (Cont)

STATION ALTITUDE 3989.0 FEET MSL
20 MAY 66 1100 HRS MST
ASCENSION NO. 361

WSTM SITE COORDINATES
E 488,580 FEET
N 185,045 FEET

GEOMETRIC ALTITUDE MSL FFFT	PRESSURE MILLIBARS	TEMPERATURE		RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			KNOTS	KNOTS	DIRECTION DEGREES(TN)	SPEED KNOTS	
48500.0	132.8	-59.5	0.	-0.	216.5	569.2		238.0	46.0	1.000048
49000.0	129.6	-59.9	0.	-0.	211.7	568.7		237.3	48.5	1.000047
49500.0	126.5	-60.2	0.	-0.	207.0	568.2		239.3	51.9	1.000046
50000.0	123.5	-60.6	0.	-0.	202.4	567.7		241.5	54.3	1.000045
50500.0	120.5	-61.0	0.	-0.	197.9	567.2		244.1	53.9	1.000044
51000.0	117.6	-61.4	0.	-0.	193.4	566.7		246.7	53.5	1.000043
51500.0	114.8	-61.7	0.	-0.	189.1	566.2		248.4	51.9	1.000042
52000.0	112.0	-62.1	0.	-0.	184.9	565.7		250.2	50.3	1.000041
52500.0	109.3	-62.5	0.	-0.	180.8	565.2		251.2	48.0	1.000040
53000.0	106.7	-62.9	0.	-0.	176.8	564.7		252.0	45.5	1.000039
53500.0	104.1	-63.2	0.	-0.	172.8	564.2		251.3	43.2	1.000038
54000.0	101.6	-63.3	0.	-0.	168.7	564.0		249.0	41.0	1.000038
54500.0	99.1	-63.2	0.	-0.	164.5	564.1		247.0	38.8	1.000037
55000.0	96.7	-63.1	0.	-0.	160.5	564.3		245.5	36.1	1.000036
55500.0	94.4	-63.0	0.	-0.	156.5	564.4		244.1	33.4	1.000035
56000.0	92.1	-62.9	0.	-0.	152.6	564.6		241.9	30.2	1.000034
56500.0	89.8	-62.8	0.	-0.	148.8	564.7		239.6	27.0	1.000033
57000.0	87.6	-62.7	0.	-0.	145.1	564.8		240.5	24.9	1.000032
57500.0	85.5	-62.6	0.	-0.	141.5	565.0		242.8	23.4	1.000032
58000.0	83.4	-63.0	0.	-0.	138.3	564.5		244.9	21.3	1.000031
58500.0	81.4	-63.5	0.	-0.	135.2	563.9		246.8	18.6	1.000030
59000.0	79.4	-63.9	0.	-0.	132.2	563.2		248.3	16.0	1.000029
59500.0	77.4	-64.4	0.	-0.	129.3	562.6		246.5	13.1	1.000029
60000.0	75.5	-64.9	0.	-0.	126.4	561.9		244.6	10.2	1.000028
60500.0	73.7	-65.4	0.	-0.	123.6	561.2		229.7	8.3	1.000028
61000.0	71.9	-65.9	0.	-0.	120.9	560.6		209.3	6.8	1.000027
61500.0	70.1	-66.4	0.	-0.	118.2	559.9		195.0	6.1	1.000026
62000.0	68.4	-65.8	0.	-0.	115.0	560.7		193.9	7.3	1.000026
62500.0	66.8	-65.2	0.	-0.	111.8	561.6		192.9	8.5	1.000025
63000.0	65.1	-64.5	0.	-0.	108.8	562.4		200.7	9.2	1.000024

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET MSL
20 MAY 66 1100 HRS MST
ASCENSION NO. 361

UPPER AIR DATA
3914012
WHITE SANDS SITE
TABLE VII (Cont)

WSTM SITE COORDINATES
E 488,580 FEET
N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			KNOTS	KNOTS	DIRECTION DEGREES(TN)	SPEED KNOTS	
63500.0	63.5	-63.9	0.	-0. **	105.8	563.3		209.0	9.8	1.000024
64000.0	62.0	-63.2	0.	-0. **	102.9	564.2		216.1	10.9	1.000023
64500.0	60.5	-62.6	0.	-0. **	100.1	565.0		222.4	12.2	1.000022
65000.0	59.0	-61.9	0.	-0. **	97.3	565.9		226.6	12.8	1.000022
65500.0	57.6	-61.3	0.	-0. **	94.7	566.7		226.2	12.0	1.000021
66000.0	56.2	-60.8	0.	-0. **	92.2	567.5		225.7	11.1	1.000021
66500.0	54.9	-60.2	0.	-0. **	89.8	568.2		221.8	10.6	1.000020
67000.0	53.6	-59.6	0.	-0. **	87.4	569.0		217.8	10.1	1.000019
67500.0	52.3	-59.1	0.	-0. **	85.1	569.7		212.7	9.1	1.000019
68000.0	51.0	-58.5	0.	-0. **	82.9	570.5		206.8	7.7	1.000018
68500.0	49.8	-58.0	0.	-0. **	80.7	571.2		200.6	6.7	1.000018
69000.0	48.7	-57.4	0.	-0. **	78.6	572.0		193.4	7.0	1.000017
69500.0	47.5	-56.8	0.	-0. **	76.5	572.7		186.1	7.4	1.000017
70000.0	46.4	-56.3	0.	-0. **	74.5	573.4		175.8	7.5	1.000017
70500.0	45.3	-55.7	0.	-0. **	72.5	574.2		165.0	7.6	1.000016
71000.0	44.2	-55.1	0.	-0. **	70.6	574.9		158.2	8.2	1.000016
71500.0	43.1	-54.6	0.	-0. **	68.8	575.7		155.3	9.3	1.000015
72000.0	42.1	-55.1	0.	-0. **	67.3	575.0		152.4	10.2	1.000015
72500.0	41.1	-55.7	0.	-0. **	65.9	574.2		149.6	8.8	1.000015
73000.0	40.2	-56.4	0.	-0. **	64.6	573.3		146.7	7.5	1.000014
73500.0	39.3	-56.2	0.	-0. **	63.1	573.5		150.4	6.5	1.000014
74000.0	38.4	-55.9	0.	-0. **	61.5	573.9		157.0	5.7	1.000014
74500.0	37.5	-55.6	0.	-0. **	60.0	574.3		170.5	4.7	1.000013
75000.0	36.6	-55.3	0.	-0. **	58.6	574.7		206.0	3.2	1.000013
75500.0	35.8	-55.0	0.	-0. **	57.2	575.2		241.5	1.6	1.000013
76000.0	35.0	-54.6	0.	-0. **	55.8	575.6		295.7	1.7	1.000012
76500.0	34.2	-54.3	0.	-0. **	54.4	576.0		356.6	2.4	1.000012
77000.0	33.4	-54.0	0.	-0. **	53.1	576.4		54.7	3.0	1.000012
77500.0	32.6	-53.7	0.	-0. **	51.8	576.9		54.7	3.0	1.000012
78000.0	31.9	-53.4	0.	-0. **	50.6	577.3		54.8	3.0	1.000011

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET MSL
20 MAY 66 1100 HRS MST
ASCENSION NO. 361

UPPER AIR DATA
3914012
WHITE SANDS SITE
TABLE VII (Cont)

WSTM SITE COORDINATES
E 488,580 FEET
N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			KNOTS	KNOTS	DIRECTION DEGREES(TN)	SPEED KNOTS	
78500.0	31.2	-53.0	0.	-0.	49.3	577.7	55.5	55.5	3.3	1.000011
79000.0	30.5	-52.7	0.	-0.	48.1	578.1	58.8	58.8	4.7	1.000011
79500.0	29.8	-52.4	0.	-0.	47.0	578.5	62.1	62.1	6.1	1.000010
80000.0	29.1	-52.1	0.	-0.	45.8	579.0	65.1	65.1	6.9	1.000010
80500.0	28.4	-51.7	0.	-0.	44.7	579.4	67.5	67.5	6.7	1.000010
81000.0	27.8	-51.4	0.	-0.	43.6	579.8	70.0	70.0	6.5	1.000010
81500.0	27.1	-51.1	0.	-0.	42.6	580.2	72.2	72.2	6.8	1.000009
82000.0	26.5	-50.8	0.	-0.	41.5	580.6	74.2	74.2	7.5	1.000009
82500.0	25.9	-50.5	0.	-0.	40.5	581.1	76.2	76.2	8.2	1.000009
83000.0	25.3	-50.1	0.	-0.	39.6	581.5	78.5	78.5	8.2	1.000009
83500.0	24.7	-49.8	0.	-0.	38.6	581.9	81.0	81.0	7.9	1.000009
84000.0	24.2	-49.5	0.	-0.	37.7	582.3	83.4	83.4	7.6	1.000008
84500.0	23.6	-49.2	0.	-0.	36.7	582.7	86.1	86.1	7.4	1.000008
85000.0	23.1	-48.9	0.	-0.	35.9	583.1	88.8	88.8	7.3	1.000008
85500.0	22.6	-48.5	0.	-0.	35.0	583.6	91.3	91.3	7.2	1.000008
86000.0	22.0	-48.2	0.	-0.	34.1	584.0	89.2	89.2	8.1	1.000008
86500.0	21.5	-47.9	0.	-0.	33.3	584.4	87.1	87.1	9.0	1.000007
87000.0	21.0	-47.6	0.	-0.	32.5	584.8	85.6	85.6	9.9	1.000007
87500.0	20.6	-47.3	0.	-0.	31.7	585.2	86.1	86.1	10.6	1.000007
88000.0	20.1	-46.9	0.	-0.	31.0	585.6	86.6	86.6	11.3	1.000007
88500.0	19.6	-46.6	0.	-0.	30.2	586.1	88.1	88.1	12.2	1.000007
89000.0	19.2	-46.3	0.	-0.	29.5	586.5	91.1	91.1	13.5	1.000007
89500.0	18.8	-46.0	0.	-0.	28.8	586.9	94.2	94.2	14.7	1.000006
90000.0	18.3	-45.7	0.	-0.	28.1	587.3	98.7	98.7	15.1	1.000006
90500.0	17.9	-45.3	0.	-0.	27.4	587.7	104.3	104.3	14.9	1.000006
91000.0	17.5	-45.0	0.	-0.	26.7	588.1	109.8	109.8	14.6	1.000006
91500.0	17.1	-44.7	0.	-0.	26.1	588.5	116.0	116.0	15.2	1.000006
92000.0	16.7	-44.4	0.	-0.	25.4	589.0	122.5	122.5	16.1	1.000006
92500.0	16.3	-44.0	0.	-0.	24.8	589.4	128.9	128.9	17.0	1.000006
93000.0	16.0	-43.7	0.	-0.	24.2	589.8	132.5	132.5	17.5	1.000005

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** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

UPPER AIR DATA
3914012
WHITE SANDS SITE
TABLE VII (Cont)

WSTM SITE COORDINATES
E 488,580 FEET
N 185,045 FEET

STATION ALTITUDE 3989.0 FEET MSL
20 MAY 66 1100 HRS MST
ASCENSION NO. 361

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	DEWPOINT CENTIGRADE	RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	SPEED KNOTS	INDEX OF REFRACTION
93500.0	15.6	-43.4	0.	-0. **	23.6	590.2	134.8	17.6	1.000005
94000.0	15.2	-43.1	0.	-0. **	23.1	590.6	137.2	17.8	1.000005
94500.0	14.9	-42.8	0.	-0. **	22.5	591.0	140.2	18.0	1.000005
95000.0	14.5	-42.4	0.	-0. **	22.0	591.4	143.6	18.2	1.000005
95500.0	14.2	-42.1	0.	-0. **	21.5	591.8	146.9	18.4	1.000005
96000.0	13.9	-41.9	0.	-0. **	21.0	592.2	148.1	17.7	1.000005
96500.0	13.6	-41.6	0.	-0. **	20.5	592.6	147.9	16.4	1.000005
97000.0	13.3	-41.3	0.	-0. **	20.0	592.9	147.7	15.1	1.000004
97500.0	13.0	-41.0	0.	-0. **	19.6	593.3	149.0	14.1	1.000004
98000.0	12.8	-40.7	0.	-0. **	19.1	593.7	152.0	13.2	1.000004
98500.0	12.5	-40.4	0.	-0. **	18.7	594.0	155.0	12.4	1.000004
99000.0	12.2	-40.1	0.	-0. **	18.3	594.4	156.0	11.5	1.000004
99500.0	11.9	-39.8	0.	-0. **	17.8	594.8	152.0	10.3	1.000004
100000.0	11.7	-39.5	0.	-0. **	17.4	595.2	147.9	9.1	1.000004
100500.0	11.4	-39.2	0.	-0. **	17.0	595.5	144.1	8.0	1.000004
101000.0	11.2	-38.9	0.	-0. **	16.6	595.9	142.1	7.6	1.000004
101500.0	10.9	-38.7	0.	-0. **	16.3	596.3	140.0	7.1	1.000004
102000.0	10.7	-38.4	0.	-0. **	15.9	596.6	138.0	6.7	1.000004
102500.0	10.5	-38.1	0.	-0. **	15.5	597.0	130.0	6.0	1.000003
103000.0	10.2	-37.8	0.	-0. **	15.2	597.4	121.6	5.3	1.000003
103500.0	10.0	-37.5	0.	-0. **	14.8	597.7	113.1	4.6	1.000003
104000.0	9.8	-37.2	0.	-0. **	14.5	598.1	108.4	4.4	1.000003
104500.0	9.6	-36.9	0.	-0. **	14.2	598.5	104.9	4.3	1.000003
105000.0	9.4	-36.6	0.	-0. **	13.8	598.9	101.4	4.2	1.000003
105500.0	9.2	-36.3	0.	-0. **	13.5	599.2	96.2	4.0	1.000003
106000.0	9.0	-36.0	0.	-0. **	13.2	599.6	89.8	3.8	1.000003
106500.0	8.8	-35.7	0.	-0. **	12.9	600.0	83.4	3.5	1.000003
107000.0	8.6	-35.4	0.	-0. **	12.6	600.3	82.3	3.1	1.000003
107500.0	8.4	-35.2	0.	-0. **	12.3	600.7	88.6	2.5	1.000003
108000.0	8.2	-34.9	0.	-0. **	12.0	601.1	94.9	1.9	1.000003

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET MSL
 20 MAY 66 1100 HRS MST
 ASCENSION NO. 361

UPPER AIR DATA
 3914J12
 WHITE SANDS SITE
 TABLE VII (Cont)

WSTM SITE COORDINATES
 E 488,580 FEET
 N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			KNOTS	KNOTS	DIRECTION DEGREES(TN)	SPEED KNOTS	
108500.0	8.1	-34.6	0.	-0. **	11.8	601.4				1.000003
109000.0	7.9	-34.3	0.	-0. **	11.5	601.8				1.000003
109500.0	7.7	-34.0	0.	-0. **	11.2	602.2				1.000002
110000.0	7.5	-33.7	0.	-0. **	11.0	602.5				1.000002
110500.0	7.4	-33.4	0.	-0. **	10.7	602.9				1.000002
111000.0	7.2	-33.1	0.	-0. **	10.5	603.3				1.000002
111500.0	7.1	-32.8	0.	-0. **	10.2	603.6				1.000002

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET MSL
 20 MAY 66 1630 HRS MST
 ASCENSION NO. 365

UPPER AIR DATA
 3914010
 WHITE SANDS SITE
 TABLE VIII

WSTM SITE COORDINATES
 E 488,580 FEET
 N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	TEMPERATURE DEWPOINT CENTIGRADE	RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA		INDEX OF REFRACTION
						KNOTS	KNOTS	DIRECTION DEGREES(TN)	SPEED KNOTS	
3985.0	874.0	30.5	3.5	18.0	999.4	679.7	0.	0.	0.	1.000255
4000.0	873.7	30.5	3.5	17.9	999.2	679.6	358.9	358.9	0.0	1.000255
4500.0	858.8	28.8	0.8	16.4	988.3	677.5	310.0	310.0	2.2	1.000247
5000.0	844.1	27.4	0.4	17.2	975.7	676.0	261.0	261.0	4.3	1.000244
5500.0	825.6	26.0	-0.3	17.7	963.5	674.4	212.1	212.1	6.4	1.000240
6000.0	815.3	24.6	-1.1	18.2	951.4	672.8	225.6	225.6	7.2	1.000236
6500.0	801.2	23.2	-1.9	18.6	939.5	671.2	240.3	240.3	8.3	1.000232
7000.0	787.3	21.8	-2.7	19.2	927.8	669.5	253.3	253.3	9.8	1.000229
7500.0	773.5	20.4	-3.3	20.0	916.0	667.9	261.3	261.3	10.3	1.000225
8000.0	755.8	18.9	-4.0	20.6	904.5	666.2	267.3	267.3	10.5	1.000222
8500.0	746.4	17.4	-4.8	21.6	893.1	664.5	266.1	266.1	11.0	1.000218
9000.0	733.3	16.0	-5.5	22.4	881.9	662.8	264.8	264.8	11.4	1.000215
9500.0	720.3	14.5	-6.1	23.5	870.7	661.1	263.1	263.1	11.3	1.000212
10000.0	707.3	13.1	-6.5	25.1	859.2	659.4	262.1	262.1	11.4	1.000209
10500.0	694.5	11.7	-6.9	26.7	847.9	657.8	263.0	263.0	11.9	1.000206
11000.0	681.9	10.2	-7.4	28.3	836.8	656.1	263.9	263.9	12.3	1.000203
11500.0	669.6	8.8	-7.9	29.9	825.9	654.5	266.5	266.5	12.4	1.000200
12000.0	657.4	7.4	-8.3	32.0	815.0	652.8	269.3	269.3	12.5	1.000197
12500.0	645.2	5.8	-8.3	35.3	804.1	651.0	272.3	272.3	12.4	1.000195
13000.0	633.1	4.3	-8.5	38.7	793.4	649.2	275.6	275.6	12.2	1.000193
13500.0	621.3	2.8	-8.8	42.1	782.9	647.5	278.9	278.9	11.9	1.000190
14000.0	609.7	1.3	-9.2	45.4	772.6	645.7	282.4	282.4	12.0	1.000187
14500.0	598.4	-0.2	-9.7	48.8	762.4	643.9	286.0	286.0	12.2	1.000185
15000.0	587.2	-1.7	-10.3	52.2	752.4	642.1	288.9	288.9	12.5	1.000182
15500.0	576.2	-3.3	-10.7	56.4	742.5	640.3	290.5	290.5	12.8	1.000179
16000.0	565.2	-4.9	-10.4	65.5	732.6	638.3	289.6	289.6	13.5	1.000178
16500.0	554.3	-6.5	-10.3	74.5	722.9	636.4	285.9	285.9	14.9	1.000176
17000.0	543.7	-8.1	-10.5	83.0	713.4	634.5	282.1	282.1	16.0	1.000174
17500.0	533.1	-9.3	-11.5	84.5	702.8	633.0	278.3	278.3	17.0	1.000170
18000.0	522.7	-10.4	-12.0	88.8	692.0	631.7	275.2	275.2	16.5	1.000168

STATION ALTITUDE 3989.0 FEET MSL
 20 MAY 66 1630 HRS MST
 ASCENSION NO. 365

UPPER AIR DATA
 3914010
 WHITE SANDS SITE
 TABLE VIII (Cont)

WSTM SITE COORDINATES
 E 488,580 FEET
 N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			KNOTS	KNOTS	DIRECTION DEGREES(TN)	SPEED KNOTS	
18500.0	512.5	-10.7	-16.2	64.4	679.5	631.2		272.0	16.0	1.000161
19000.0	502.4	-12.0	-17.0	67.1	669.5	629.6		268.5	15.3	1.000158
19500.0	492.5	-13.4	-17.8	69.9	659.8	627.9		266.0	14.8	1.000155
20000.0	482.7	-14.7	-18.6	72.6	650.2	626.3		264.0	14.5	1.000153
20500.0	473.2	-15.8	-21.2	63.6	640.0	624.9		263.2	16.0	1.000149
21000.0	463.7	-16.6	-26.3	43.0	629.3	623.9		264.6	17.1	1.000144
21500.0	454.4	-17.4	-28.7	37.0	618.8	622.8		269.0	17.6	1.000141
22000.0	445.2	-18.3	-29.5	37.0	608.4	621.7		272.5	18.0	1.000139
22500.0	436.3	-19.2	-30.3	37.0	598.2	620.7		275.9	18.3	1.000136
23000.0	427.4	-20.2	-30.8	38.6	588.5	619.4		280.5	18.1	1.000134
23500.0	418.7	-21.5	-30.6	44.3	579.6	617.8		284.7	17.8	1.000132
24000.0	410.2	-22.9	-30.6	49.9	570.8	616.1		287.8	17.5	1.000130
24500.0	401.7	-24.1	-32.1	48.5	561.9	614.6		290.0	17.1	1.000128
25000.0	393.4	-25.3	-34.4	42.9	552.9	613.1		290.9	16.6	1.000125
25500.0	385.3	-26.5	-36.9	37.3	544.1	611.6		289.5	16.4	1.000123
26000.0	377.1	-27.7	-38.8	34.4	535.2	610.1		286.5	16.4	1.000121
26500.0	369.1	-28.9	-40.1	33.3	526.4	608.6		285.7	16.9	1.000118
27000.0	361.3	-30.0	-41.5	32.3	517.7	607.2		285.0	17.4	1.000116
27500.0	353.6	-31.2	-42.9	31.2	509.1	605.7		283.5	17.9	1.000114
28000.0	346.0	-32.4	-44.2	30.1	500.7	604.2		281.0	19.5	1.000112
28500.0	338.7	-33.6	-45.6	29.1	492.5	602.7		277.7	22.0	1.000110
29000.0	331.5	-34.7	-47.0	28.0	484.4	601.3		276.0	25.7	1.000108
29500.0	324.4	-35.9	-48.3	27.0	476.4	599.8		274.4	29.4	1.000107
30000.0	317.5	-37.1	-49.8	25.8**	468.6	598.3		272.9	33.1	1.000105
30500.0	310.4	-38.3	-51.6	23.7**	460.4	596.7		270.9	34.8	1.000103
31000.0	303.4	-39.5	-53.4	21.5**	452.4	595.2		268.8	36.0	1.000101
31500.0	296.6	-40.7	-55.3	19.4**	444.6	593.7		266.3	38.7	1.000099
32000.0	290.0	-41.9	-57.3	17.2**	436.9	592.1		264.1	40.8	1.000097
32500.0	283.5	-43.1	-59.4	15.1**	429.3	590.6		262.1	42.4	1.000096
33000.0	277.1	-44.3	-61.6	12.9**	421.9	589.0		262.7	48.8	1.000094

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET MSL
 20 MAY 66 1630 HRS MST
 ASCENSION NO. 365

UPPER AIR DATA
 3914010
 WHITE SANDS SITE
 TABLE VIII (Cont)

WSTM SITE COORDINATES
 E 488,580 FEET
 N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			KNOTS	KNOTS	DIRECTION DEGREES(TN)	SPEED KNOTS	
33500.0	270.9	-45.5	-63.9	10.7**	414.7	587.5	263.5	263.5	55.6	1.000092
34000.0	264.9	-46.7	-66.6	8.6**	407.5	585.9	262.6	262.6	57.9	1.000091
34500.0	258.9	-47.9	-69.6	6.4**	400.5	584.4	261.9	261.9	60.3	1.000089
35000.0	253.1	-49.1	-73.2	4.3**	393.6	582.8	261.4	261.4	62.9	1.000088
35500.0	247.5	-50.3	-78.6	2.1**	386.9	581.2	260.9	260.9	63.2	1.000086
36000.0	241.9	-51.5	0.	-0. **	380.3	579.7	260.4	260.4	60.9	1.000085
36500.0	236.2	-52.4	0.	-0. **	372.9	578.5	259.8	259.8	60.0	1.000083
37000.0	230.7	-53.4	0.	-0. **	365.7	577.3	259.2	259.2	59.7	1.000081
37500.0	225.2	-54.3	0.	-0. **	358.6	576.0	258.9	258.9	59.8	1.000080
38000.0	219.9	-55.2	0.	-0. **	351.6	574.8	258.6	258.6	60.6	1.000078
38500.0	214.8	-56.1	0.	-0. **	344.8	573.6	257.5	257.5	66.6	1.000077
39000.0	209.7	-57.1	0.	-0. **	338.1	572.4	257.1	257.1	68.5	1.000075
39500.0	204.8	-58.0	0.	-0. **	331.6	571.2	257.9	257.9	63.2	1.000074
40000.0	200.0	-58.9	0.	-0. **	325.2	569.9	258.4	258.4	61.1	1.000072
40500.0	195.2	-59.2	0.	-0. **	317.8	569.6	258.8	258.8	60.1	1.000071
41000.0	190.5	-59.2	0.	-0. **	310.3	569.5	259.7	259.7	51.5	1.000069
41500.0	186.0	-59.3	0.	-0. **	303.0	569.4	259.2	259.2	49.7	1.000067
42000.0	181.5	-59.4	0.	-0. **	295.8	569.3	257.4	257.4	54.9	1.000066
42500.0	177.2	-59.4	0.	-0. **	288.8	569.3	256.0	256.0	56.0	1.000064
43000.0	172.9	-59.5	0.	-0. **	282.0	569.2	254.7	254.7	56.2	1.000063
43500.0	168.8	-59.6	0.	-0. **	275.3	569.1	254.7	254.7	56.0	1.000061
44000.0	164.7	-60.1	0.	-0. **	269.4	568.3	254.6	254.6	55.7	1.000060
44500.0	160.8	-61.2	0.	-0. **	264.3	566.9	254.0	254.0	54.6	1.000059
45000.0	156.9	-61.3	0.	-0. **	258.0	566.8	253.0	253.0	52.6	1.000057
45500.0	153.1	-61.3	0.	-0. **	251.8	566.7	250.9	250.9	46.6	1.000056
46000.0	145.4	-61.4	0.	-0. **	245.8	566.7	249.2	249.2	44.6	1.000055
46500.0	145.8	-61.4	0.	-0. **	239.9	566.6	248.2	248.2	51.1	1.000053
47000.0	142.3	-61.5	0.	-0. **	234.1	566.5	246.4	246.4	52.8	1.000052
47500.0	138.8	-61.5	0.	-0. **	228.5	566.5	244.0	244.0	51.5	1.000051
48000.0	135.5	-61.6	0.	-0. **	223.1	566.4	244.7	244.7	55.2	1.000050

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET MSL
20 MAY 66 1630 HRS MST
ASCENSION NO. 265

UPPER AIR DATA
3914010
WHITE SANDS SITE
TABLE VIII (Cont)

WSTM SITE COORDINATES
E 488,580 FEET
N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			KNOTS	KNOTS	DIRECTION DEGREES(TN)	SPEED KNOTS	
48500.0	132.2	-61.6	0.	-0. **	217.7	566.3	244.2	244.2	55.3	1.000048
49000.0	129.0	-61.7	0.	-0. **	212.5	566.3	241.8	241.8	49.3	1.000047
49500.0	125.9	-61.6	0.	-0. **	207.3	566.4	243.2	243.2	47.8	1.000046
50000.0	122.9	-59.6	0.	-0. **	200.5	569.0	246.9	246.9	48.9	1.000045
50500.0	119.9	-59.7	0.	-0. **	195.7	568.9	250.0	250.0	49.4	1.000044
51000.0	117.0	-59.8	0.	-0. **	191.1	568.7	252.8	252.8	49.8	1.000043
51500.0	114.2	-60.7	0.	-0. **	187.3	567.6	254.9	254.9	47.0	1.000042
52000.0	111.5	-61.5	0.	-0. **	183.5	566.4	256.4	256.4	44.1	1.000041
52500.0	108.8	-61.2	0.	-0. **	178.8	566.9	256.0	256.0	41.0	1.000040
53000.0	106.2	-60.5	0.	-0. **	174.0	567.8	254.7	254.7	38.6	1.000039
53500.0	103.0	-61.3	0.	-0. **	170.3	566.8	252.5	252.5	36.9	1.000038
54000.0	101.0	-62.1	0.	-0. **	166.9	565.6	249.3	249.3	36.7	1.000037
54500.0	98.4	-63.0	0.	-0. **	163.4	564.5	245.7	245.7	37.2	1.000036
55000.0	96.2	-63.8	0.	-0. **	160.1	563.3	241.3	241.3	36.2	1.000036
55500.0	93.6	-64.7	0.	-0. **	156.6	562.2	236.5	236.5	34.7	1.000035
56000.0	91.5	-65.5	0.	-0. **	153.6	561.1	234.0	234.0	31.4	1.000034
56500.0	89.3	-66.4	0.	-0. **	150.5	559.9	232.2	232.2	27.3	1.000034
57000.0	87.1	-65.9	0.	-0. **	146.5	560.5	234.0	234.0	23.4	1.000033
57500.0	85.0	-65.6	0.	-0. **	142.6	560.6	237.2	237.2	19.5	1.000032
58000.0	82.8	-66.4	0.	-0. **	139.6	559.9	241.5	241.5	17.4	1.000031
58500.0	80.8	-66.5	0.	-0. **	136.5	559.2	246.1	246.1	15.9	1.000030
59000.0	78.8	-67.4	0.	-0. **	133.4	558.5	241.4	241.4	15.5	1.000030
59500.0	76.8	-67.9	0.	-0. **	130.4	557.8	236.1	236.1	15.3	1.000029
60000.0	74.9	-68.4	0.	-0. **	127.5	557.1	231.2	231.2	15.5	1.000028
60500.0	73.0	-68.9	0.	-0. **	124.6	556.4	227.6	227.6	15.6	1.000028
61000.0	71.2	-65.4	0.	-0. **	121.8	555.7	227.1	227.1	15.5	1.000027
61500.0	69.5	-69.6	0.	-0. **	118.9	555.6	230.5	230.5	16.5	1.000026
62000.0	67.7	-68.6	0.	-0. **	115.5	556.6	238.1	238.1	18.6	1.000026
62500.0	66.0	-68.0	0.	-0. **	112.2	557.7	243.6	243.6	17.6	1.000025
63000.0	64.4	-67.3	0.	-0. **	109.0	556.7	248.1	248.1	15.0	1.000024

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET MSL
 20 MAY 66 1630 HRS MST
 ASCENSION NO. 365

UPPER AIR DATA
 3914010
 WHITE SANDS SITE
 TABLE VIII (Cont)

WSTM SITE COORDINATES
 E 488,580 FEET
 N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			KNOTS	KNOTS	DIRECTION DEGREES(TN)	SPEED KNOTS	
63500.0	62.8	-66.5	0.	-0. **	105.9	559.8		256.0	12.8	1.000024
64000.0	61.2	-65.7	0.	-0. **	102.9	560.8		264.5	10.7	1.000023
64500.0	59.8	-63.2	0.	-0. **	99.2	564.2		272.9	10.1	1.000022
65000.0	58.3	-60.4	0.	-0. **	95.5	567.9		282.0	9.2	1.000021
65500.0	56.9	-59.6	0.	-0. **	92.9	569.0		294.1	7.8	1.000021
66000.0	55.6	-59.3	0.	-0. **	90.6	569.4		311.3	6.2	1.000020
66500.0	54.3	-59.1	0.	-0. **	88.3	569.7		340.7	4.5	1.000020
67000.0	53.0	-58.8	0.	-0. **	86.2	570.0		19.0	7.1	1.000019
67500.0	51.8	-58.6	0.	-0. **	84.0	570.4		67.4	14.4	1.000019
68000.0	50.5	-58.3	0.	-0. **	82.0	570.7		75.9	11.8	1.000018
68500.0	49.4	-58.0	0.	-0. **	79.9	571.1		78.2	13.2	1.000018
69000.0	48.2	-57.8	0.	-0. **	78.0	571.4		80.1	14.0	1.000017
69500.0	47.1	-57.5	0.	-0. **	76.0	571.8		84.3	11.6	1.000017
70000.0	46.0	-57.3	0.	-0. **	74.2	572.1		85.3	16.9	1.000017
70500.0	44.9	-57.0	0.	-0. **	72.3	572.4		91.0	17.0	1.000016
71000.0	43.8	-56.8	0.	-0. **	70.6	572.8		91.4	17.8	1.000016
71500.0	42.8	-56.5	0.	-0. **	68.8	573.1		90.6	17.2	1.000015
72000.0	41.8	-56.2	0.	-0. **	67.1	573.5		100.9	8.8	1.000015
72500.0	40.8	-56.0	0.	-0. **	65.5	573.8		113.7	5.2	1.000015
73000.0	39.8	-55.7	0.	-0. **	63.8	574.2		126.6	1.9	1.000014
73500.0	38.9	-55.5	0.	-0. **	62.3	574.5		156.9	2.9	1.000014
74000.0	38.0	-55.2	0.	-0. **	60.7	574.8		189.6	4.5	1.000014
74500.0	37.1	-55.0	0.	-0. **	59.2	575.2		222.3	6.2	1.000013
75000.0	36.2	-54.7	0.	-0. **	57.8	575.5		210.9	5.5	1.000013
75500.0	35.4	-54.4	0.	-0. **	56.4	575.9		194.1	4.5	1.000013
76000.0	34.5	-54.2	0.	-0. **	55.0	576.2		177.3	3.6	1.000012
76500.0	33.7	-53.9	0.	-0. **	53.6	576.5		185.0	4.7	1.000012
77000.0	32.9	-53.7	0.	-0. **	52.3	576.9		198.7	6.4	1.000012
77500.0	32.2	-53.4	0.	-0. **	51.0	577.2		212.4	8.1	1.000011
78000.0	31.4	-53.1	0.	-0. **	49.7	577.5				1.000011

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

STATION ALTITUDE 3989.0 FEET MSL
 20 MAY 66 1630 HRS MST
 ASCENSION NO. 365

UPPER AIR DATA
 3914010
 WHITE SANDS SITE
 TABLE VIII (Cont)

WSTM SITE COORDINATES
 E 488,580 FEET
 N 185,045 FEET

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			KNOTS	KNOTS	DIRECTION DEGREES(TN)	SPEED KNOTS	
78500.0	30.7	-52.9	0.	-0. **	48.5	577.9				1.000011
79000.0	29.9	-52.6	0.	-0. **	47.3	578.2				1.000011
79500.0	29.2	-52.4	0.	-0. **	46.1	578.6				1.000010
80000.0	28.6	-52.1	0.	-0. **	45.0	578.9				1.000010

** AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

RELEASE TIME (MST)		IMPACT DISPLACEMENT IN MILES DUE TO WIND								THEORETICAL IMPACT IN MILES FROM LAUNCHER					
		143- 4000 FT				4000- 20000 FT						20000- 100000 FT		TOTAL	
		N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W						
RAWINSONDE	PIBAL	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W	N-S	E-W		
R ₁ 1100	R 1100	P 1330	6.0S	9.9W	1.5S	6.5W	4.9S	10.4W	12.4S	26.8W	59.3N	9.0W			
R ₂ 1330	R 1100	P 1400	11.9S	1.4W	0.1N	5.9W	4.9S	10.4W	16.7S	17.7W	55.0N	0.1E			
R ₂ 1330	R 1100	P 1430	1.8N	16.1W	0.1N	5.9W	4.9S	10.4W	3.0S	32.4W	68.7N	14.6W			
R ₂ 1330	R 1100	P 1450	22.0S	6.6W	0.1N	5.9W	4.9S	10.4W	26.8S	22.9W	43.1N	5.1W			
R ₂ 1330	R ₃ 1330	P 1510	7.5S	2.5E	0.1N	5.9W	3.5S	10.1W	10.9S	13.5W	60.8N	4.3E			
R ₂ 1330	R ₃ 1330	P 1530	37.7S	10.2W	0.1N	5.9W	3.5S	10.1W	41.1S	26.2W	30.6N	8.4W			
R ₂ 1330	R ₃ 1330	P 1545	34.6S	29.0W	0.1N	5.9W	3.5S	10.1W	38.0S	45.0W	33.7N	27.2W			
R ₂ 1330	R ₃ 1330	P 1558	13.8S	9.3W	0.1N	5.9W	3.5S	10.1W	17.2S	25.3W	54.5N	7.5W			
R ₂ 1600	R ₃ 1330	P 1615	3.5S	8.1W	1.0S	9.4W	3.5S	10.1W	8.0S	27.6W	63.7N	9.8W			
R ₂ 1600	R ₃ 1330	P 1620	9.2S	5.1W	1.0S	9.4W	3.5S	10.1W	13.7S	24.6W	58.0N	6.8W			
R ₂ 1600	R ₃ 1330	P 1625	10.6S	0.6W	1.0S	9.4W	3.5S	10.1W	15.1S	20.1W	56.6N	2.3W			
*R ₁ 1630	*R 1630	*P 1631	4.8S	5.8W	0.8N	10.6W	2.7S	12.7W	6.7S	29.1W	65.0N	11.3W			

TIME: 1630 MST
DATE: 20 May 1966

TABLE IX. IMPACT PREDICTION DATA
AEROBEE NASA 4.92

* = Post-Shoot Data
P = Double Theodolite Winds (143-4,000 FT)
R = Rawinsonde Winds (Above 20,000 FT)
R₁ = Rawinsonde Winds (4,000-20,000 FT)
R₂ = Rawin Winds (4,000-20,000 FT)
R₃ = Rawin Winds (Above 20,000 FT)

JACK SETTINGS FOR LAUNCHER B	West leg	41	inches	PREDICTED IMPACT FROM LAUNCHER	North	50.0	miles
	East leg	28	inches		E-W	0.0	miles
LAUNCHER SETTING	Tilt	4.00	degrees	PREDICTED BOOSTER IMPACT FROM LAUNCHER	Azimuth	015	degrees
	Azimuth	018.1	degrees		Distance	1,200	feet
TILT COMPONENTS	North	3.80	degrees	RECOMMENDATION - No Fire, with 75% confidence of impacting on range, based upon: wind correction of 23 miles 1-hr wind variability of 41 miles 20 May 1966/1627 MST			
	East	1.24	degrees				
NO WIND IMPACT FROM LAUNCHER	North	71.8	miles				
	East	17.8	miles				

TABLE X. ACTUAL AND PREDICTED LAUNCH DATA
AEROBEE NASA 4.92

RADAR IMPACT FROM LAUNCHER	North	63.2	miles
	West	10.4	miles
ACTUAL BOOSTER IMPACT FROM LAUNCHER	Azimuth	N/A	degrees
	Distance	N/A	feet

TABLE XI. IMPACT DATA
AEROBEE NASA 4.92

UNCLASSIFIED

Security Classification

DOCUMENT CONTROL DATA - R&D		
(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)		
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4. DESCRIPTIVE NOTES (Type of report and inclusive dates)		
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10. AVAILABILITY/LIMITATION NOTICES Qualified requesters may obtain copies of this report from DDC.		
11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY U. S. Army Electronics Command Atmospheric Sciences Laboratory White Sands Missile Range, New Mexico	
13. ABSTRACT Meteorological data gathered for the launching of Aerobee NASA 4.92 are presented for the National Aeronautics and Space Administration and for ballistic studies. The data appear, along with calculated ballistic data, in tabular form.		

14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
1. Ballistics 2. Meteorology 3. Wind						

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